# Haval Health Research Center Detachment Coxicology)

Feb 2003

Impact of Capsicum Spray On Individuals With Degraded Health

**TOXDET-03-03** 

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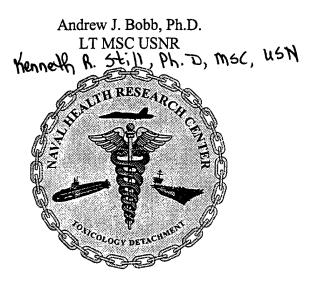
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#### **PREFACE**

This review was conducted at the Naval Health Research Center Detachment Toxicology (NHRC/TD) under the direction of CDR Warren W. Jederberg, MS, MSC, USN, Officer-in-Charge NHRC/TD. It was performed under the Toxicity Profile/Human Health Risk Assessment program at the request of the U.S. Coast Guard via the Naval Environmental Health Center.

The opinions contained herein are those of the author and are not to be construed as official or reflecting the view of the Department of Defense, the Department of the Navy or the Naval Services at large.

# IMPACT OF CAPSICUM SPRAY ON INDIVIDUALS WITH DEGRADED HEALTH



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## ABSTRACT

Capsicum (pepper) spray is being used in law enforcement to replace more damaging CS and CD agents. Animal, human volunteer and accidental exposure data suggest that the probability of undesired effects is minimal, even to asthmatics and other individuals likely to be hypersensitive to irritants.

Capsicum (pepper) spray has been introduced in law enforcement scenarios primarily as a substitute for the alkylating agents (CS and CD) which were known to cause lethal airway diseases. It is generally considered a significant safety improvement, although it remains a significant airway irritant. This report has been prepared in response to concerns expressed over the possibility of dangerous reactions to capsicum in persons with compromised or hyperactive airways.

Experimental rat and mouse exposure (1) and analysis of human exposure through law enforcement use of pepper spray and gas (2) both conclude that there is little likelihood of an acute toxic response in healthy adults. Reports of children experiencing acute, life-threatening respiratory distress (3,4) are the result of extreme levels of exposure, but must be considered. Research performed on the nasal passages of human volunteers with allergic rhinitis suggests that airway passages which are already agitated can constrict with extreme exposure to capsaicin, the active ingredient in pepper spray (5). However, studies of individuals with asthma and chronic obstructive pulmonary disease show that although capsaicin exposure causes increased coughing, there does not seem to be any correlation with airflow limitation (6); furthermore, research performed on guinea-pigs in an induced nonacute asthma-like state agrees with the suggestion that capsaicin exposure would not cause airway constriction in asthmatics (7). In individuals with long-term exposure to irritant fumes, capsaicin challenge causes increased coughing, but did not cause wheezing or other asthma-like symptoms (8).

In summary, no evidence suggests that capsicum spray used in a conventional fashion represents any harm, even to people with imperfect respiratory health. Hyperexposure to pepper spray could cause respiratory distress, particularly in the young. No research was found relating to exposure of individuals already in acute respiratory distress. Consequently, individuals who are gasping, wheezing, or visibly cyanotic should probably not be targets for capsicum restraint; however, it seems unlikely that such persons would represent a threat appropriate for the use of capsicum.

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REPORT DOCUMENTATION PAGE				Form Approved OMB No. 0704-0188
Public reporting burden for this collection of and maintaining the data needed, and co- information, including suggestions for reduc-	f information is estimated impleting and reviewing bing this burden, to Wash	to average 1 hour p the collection of info lington Headquarters	er response, including the time for reviewing i mation. Send comments regarding this burd Services. Directorate for information Operation	nstructions, searching existing data sources, gathering en estimate or any other aspect of this collection of ns and Reports, 1215 Jefferson Davis Highway, Suite DC 20503.
1. AGENCY USE ONLY (Leave blank)   2. REPORT DATE   3. REPORT TYPE AND DATES				S COVERED
January 2003 4. TITLE AND SUBTITLE				N/A 5. FUNDING NUMBERS
Impact Of Capsicum Spray On Individuals With Degraded Health				
6. AUTHOR(S) Andrew J. Bobb, Ph.D., LT MSC USNR, Length 8. Still Ph.D., MSC, USN 7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)				
Naval Health Research Center Detachment Toxicology				8. PERFORMING ORGANIZATION REPORT NUMBER
NHRC/TD 2612 Fifth Street, Building 433				TOXDET-03- 03
Area B Wright-Patterson AFB, OH 45433-7903				
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9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Nava! Health Research Center Detachment Toxicology				AGENCY REPORT NUMBER
NHRC/TD 2612 Fifth Street, Building 43	2			
Area B				
Wright-Patterson AFB, OH 45433-7903				
11. SUPPLEMENTARY NOTE	S			
12a. DISTRIBUTION AVAILABILITY STATEMENT				12b. DISTRIBUTION CODE
Approved for public release; distribution is unlimited.				
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13. ABSTRACT (Maximum	200 words)			
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				red effects is minimal, even to
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				5
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